

## REMARKS

### A. Objection to Specification

In the Office Action mailed on August 9, 2006, the Specification was objected to for referring to the constants  $\alpha_1$  and  $\alpha_2$  as time constants. In view of the present amendment to the Specification that changes the term “time constant” to “decay rate constant”, the objection has been overcome and should be withdrawn.

### B. 35 U.S.C. § 101

#### 1. Non-statutory Subject Matter

##### a. Claims 1-7

Claims 1-7 were rejected in the Office Action of August 9, 2006 (hereinafter “the Office Action”) under 35 U.S.C. §101 for being directed to non-statutory subject matter for failing to recite a “useful, concrete and tangible” outcome. Applicant traverses the rejection for several reasons. First, the outcome of the invention of independent claim 1 is useful pursuant to 35 U.S.C. § 101 for the reasons given in Applicant’s Appeal Brief mailed on May 22, 2006 (hereinafter “Applicant’s Appeal Brief”), the entire contents of which are incorporated herein by reference. Second, the outcome of the invention of claim 1 is concrete in that the age determined in claim 1 can be substantially repeated, given the same operating conditions. An example of such repeatability is the embodiment of the invention that uses the following equation of claim 2 to determine the age of an object:

$$t = (\alpha_1 - \alpha_2)^{-1} \cdot \ln \left( \frac{\sigma}{\sigma_0} \right).$$

The equation determines the time in view of three constants  $\alpha_1$ ,  $\alpha_2$  and  $\sigma_0$  and the ratio  $\sigma$  that are not dependent on external parameters. The ratio  $\sigma$  only depends on the measured values of the scents at a reference time and the amount of time that elapses as measured from the reference time per equation (2) in Applicant's Specification. Thus, the equation generates repeatable results. For example, if it was theoretically possible to have two identical objects, identically and simultaneously apply the same two scents to them and measure the reference ratio for both objects at the same time, then the age determined for each object should be identical according to the present invention. Accordingly, the outcome of the invention of claim 1 is concrete.

Besides providing a useful and concrete outcome, the invention of claim 1 provides a tangible result in that one of ordinary skill would immediately appreciate the usefulness of claim 1's determination of an age of an object when it is used for determining the age of perishable foodstuffs so as to avoid spoilage. As mentioned in MPEP § 2106 C.2.b), the "tangible" requirement does not necessarily mean that the "claim must be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing." An invention is tangible if it results in producing a beneficial result. MPEP § 2106 C.2.b). It cannot be disputed that determining the age of an object pursuant to the invention of claim 1 would produce a beneficial result.

Despite the fact that claim 1 as previously presented recited a "useful, concrete and tangible" outcome, claim 1 is being amended to recite that the age is displayed. Since it cannot be disputed that displaying the age of an object produces a "useful, concrete and tangible" outcome, the rejection should be withdrawn.

Claims 2-7 depend directly or indirectly on claim 1 and so their rejections are improper for the same reasons given above as to why the rejection of claim 1 is improper.

Note that claims 1, 2 and 5 have been amended to replace “decay rate” with “decay rate constant” in order to be consistent with the specification. Since the amendments do not change the scope or intended meaning of the claims, the amendments are not being made for reasons related to patentability as defined in *Festo Corporation v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd*, 234 F.3d 558, 56 USPQ2d 1865 (Fed. Cir. 2000) (*en banc*), *overruled in part*, 535 U.S. 722 (2002).

**b. Claim 8**

Claim 8 was rejected in the Office Action under 35 U.S.C. §101 for being directed to non-statutory subject matter for failing to recite a “useful, concrete and tangible” outcome. Applicant traverses the rejection for several reasons. First, the outcome of the invention of independent claim 8 is useful pursuant to 35 U.S.C. § 101 for the reasons given in Applicant’s Appeal Brief. Second, the outcome of the invention of claim 8 is concrete in that the freshness of goods determined in claim 8 can be substantially repeated, given the same operating conditions. Applicant’s Specification describes an embodiment of a method for determining freshness that is based on the equation of claim 2. As mentioned above in Section B.1.a, the equation of claim 2 produces repeatable results and so the outcome of the invention of claim 8 is concrete.

Besides providing a useful and concrete outcome, the invention of claim 8 provides a tangible result in that one of ordinary skill would immediately appreciate the usefulness of claim 8’s determination of the freshness of goods so as to avoid spoilage. This is the type of result that

should be considered to be beneficial and so tangible under MPEP § 2106 C.2.b.

Despite the fact that claim 8 as previously presented recited a “useful, concrete and tangible” outcome, claim 8 is being amended to recite that an indicator of the freshness is displayed. Since it cannot be disputed that displaying an indicator of the freshness of goods produces a “useful, concrete and tangible” outcome, the rejection should be withdrawn.

Note that claim 8 has been amended to replace “decay rate” with “decay rate constant” in order to be consistent with the specification. Since the amendment does not change the scope or intended meaning of the claim, the amendment is not being made for reasons related to patentability as defined in *Festo*.

c. **Claim 9**

Claim 9 was rejected in the Office Action under 35 U.S.C. §101 for being directed to non-statutory subject matter for failing to recite a “useful, concrete and tangible” outcome. Applicant traverses the rejection in that such a rejection cannot be presented unless it is shown that the claimed invention does not transform “an article or physical object to a different state or thing” pursuant to MPEP § 2106C.2. In the present case, claim 9 recites spraying two volatile components on an object. The presence of the two volatile components on the object necessarily changes the nature of the object in that it has additional components placed thereon and a different scent is generated. Accordingly, the method is statutory pursuant to MPEP § 2106C.2 and so the rejection should be withdrawn.

**d. Claims 10 and 11**

Claims 10 and 11 were rejected in the Office Action under 35 U.S.C. §101 for being directed to non-statutory subject matter for failing to recite a “useful, concrete and tangible” outcome. Claim 10 has been amended to recite the process of “determining whether said impermeable seal is broken based on said reference scent ratio ( $\sigma_0$ ).” The outcome of the invention of independent claim 10 is useful pursuant to 35 U.S.C. § 101 for the reasons given in Applicant’s Appeal Brief. The outcome of the invention of claim 10 is concrete in that the determination of whether a seal is broken as determined in claim 10 can be substantially repeated, given the same operating conditions. For example, if it was theoretically possible to have two identical objects that are sealed in an identical manner and then measure the reference scent ratio for both objects at the same time and in the same manner, then the change in a current scent ratio with respect to the reference scent ratio would be the same if both objects were unsealed simultaneously and in an identical manner.

Besides providing a useful and concrete outcome, the invention of claim 10 provides a tangible result in that one of ordinary skill would immediately appreciate the usefulness of claim 10’s determination of whether a seal was broken when it is used for determining if the contents of the sealed object may be spoiled or tampered with by outside influences. It cannot be disputed that determining whether the contents of a sealed object may be spoiled or tampered with pursuant to the invention of claim 10 would produce a beneficial result. Since determining whether a seal is broken as defined in claim 10 produces a “useful, concrete and tangible” outcome, the rejection should be withdrawn.

Claim 11 depends directly or indirectly on claim 10 and so its rejection is improper for the same reasons given above as to why the rejection of claim 10 is improper.

e. **Claim 12**

Claim 12 was rejected in the Office Action under 35 U.S.C. §101 for being directed to non-statutory subject matter for failing to recite a “useful, concrete and tangible” outcome. Applicant traverses the rejection. As mentioned above in Section B.1.a, the method for determining an age of an object recites a “useful, concrete and tangible” outcome. Since claim 12 recites a system for determining an age of an object, the invention of claim 12 generates a “useful, concrete and tangible” outcome for reasons similar to those given above in Section B.1.a with respect to claim 1. Accordingly, the rejection is improper and should be withdrawn.

Despite the impropriety of the rejection, claim 12 is being amended to recite “a display for displaying an indicator of said age” of the object. Since display of an indicator of the age of an object produces a “useful, concrete and tangible” outcome, the rejection should be withdrawn.

2. **Utility**

a. **Claims 1-8 and 12**

Claims 1-8 and 12 were rejected in the Office Action under 35 U.S.C. §101 for lacking utility for being inoperative. Applicant traverses the rejection for being based on false assumptions and faulty analysis. In particular, the Office Action asserts at page 4 that:

The unknown function  $\eta(\xi, t)$  cannot be identical for the two different sensors of the electronic nose with different decay constant. If  $\eta(\xi, t)$  is considered the same, then  $\alpha_1 = \alpha_2$ ,  $I_1 = I_2$  (sic), . . . etc. which would make the alleged equation invalid. It is not apparent how an unknown function  $\eta(\xi, t)$  with so many

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variable factors that is applied to different sensors would have exactly the same functional representation without having a significant error factor.

It appears that the Examiner has failed to take into account paragraph 0027 of Applicant's Specification which states:

Since the two signals  $[I_1(t, \xi(t)) = \eta_1(\xi(t)) I_{01} \cdot e^{-\alpha_1 t}$  and  $I_2(t, \xi(t)) = \eta_2(\xi(t)) I_{02} \cdot e^{-\alpha_2 t}]$  are always measured simultaneously, the term  $(\eta(\xi(t)))$  is essentially identical in both expressions. This constitutes a close approximation provided that the two substances show similar absorption behavior (e.g., due to identical attachment groups of molecules) and that the external parameters are kept within reasonable limits (e.g.  $\pm 20\%$ ). (Bracketed material added)

The above passage makes it quite clear that  $\eta(\xi(t))$  is not the same for both sensors. The passage does state that they are "essentially identical" provided that the two substances show similar absorption behavior and the external parameters are kept within reasonable limits. This assumption is made when arriving at equation 3 at page 5 of Applicant's specification.

The Office Action has asserted that making the above assumption will result in  $\alpha_1 = \alpha_2$ . The Office Action has missed the point of the assumption. The assumption is being made so that the eta terms of equation 2 at page 5 of Applicant's Specification cancel one another out. Equation 2 of Applicant's Specification is written below, wherein subscripts 1 and 2 have been added to the  $\eta(\xi(t))$  terms for each sensor so to clarify that the eta terms are not identical.

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With that said, equation 2 (as currently amended) is written as follows:

$$\begin{aligned}\sigma &= I_2(t, \xi(t)) / I_1(t, \xi(t)) \\ &= \eta_2(\xi(t)) I_{02} e^{-\alpha_2 t} / \eta_1(\xi(t)) I_{01} e^{-\alpha_1 t} \\ &= [\eta_2(\xi(t)) / \eta_1(\xi(t))] * [I_{02} / I_{01}] * [e^{-\alpha_2 t} / e^{-\alpha_1 t}] \\ &\approx 1 * [I_{02} / I_{01}] * [e^{-\alpha_2 t} / e^{-\alpha_1 t}] \\ &= \sigma_0 \cdot e^{(\alpha_1 - \alpha_2)t}, \text{ wherein } \sigma_0 = I_{02} / I_{01}.\end{aligned}$$

Applicant's assumptions do not include having  $\alpha_1 = \alpha_2$  and  $I_1 = I_2$  and so equations 2) and 3) of Applicant's Specification are valid. Accordingly, the rejection is improper and should be withdrawn.

Claims 2-7 depend directly or indirectly on claim 1 and so their rejections are improper for the same reasons given above as to why the rejection of claim 1 is improper.

**b. Claim 9**

Claim 9 was rejected in the Office Action under 35 U.S.C. §101 for lacking utility because the characteristics of the first and second volatile components and the volatile identification code was unknown. Claim 9 has been amended to clarify that "volatile" characteristics of the two volatile components define the volatile identification. Furthermore, one of ordinary skill would readily understand from the embodiment of paragraphs 0032-0037 how to use multiple sensors to generate unique scent prints to be used as an identification code. Since the invention of claim 9 is useful pursuant to 35 U.S.C. §101, the rejection should be withdrawn.

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**c.     Claims 10 and 11**

Claims 10 and 11 were rejected in the Office Action under 35 U.S.C. §101 for lacking utility for being inoperative. The rejection is based on the assertion that the  $\eta$  factors are not identical for the method of sealing an object of claims 10 and 11. However, as mentioned above in Section B.2.a, Applicant has only assumed that the  $\eta$  factors of each sensor cancel one another out in equation 2). Accordingly, the formula used in paragraph 0049 to check the sealing of an object is correct and so the rejection is improper.

**C.     New Claims 13 and 14**

Since claims 13 and 14 are being added in order to provide additional coverage for the method of claim 9 and the system of claim 12, respectively, the claims are not being presented for reasons related to patentability as defined in *Festo*.

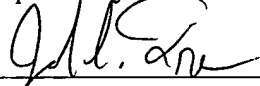
**CONCLUSION**

In view of the arguments above, Applicant respectfully submits that all of the pending claims 1-14 are in condition for allowance and seek an early allowance thereof. If for any reason, the Examiner is unable to allow the application in the next Office Action and believes that an

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interview would be helpful to resolve any remaining issues, he is respectfully requested to  
contact the undersigned attorney at (312) 321-4200.

Respectfully submitted,



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